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Eleanor Quested, Ph.D., and Joan L. Duda, Ph.D.

Abstract

Limited research has considered the social-environmental and motivational processes predictive of self evaluations and body-related concerns. Evidence suggests that low self-esteem, poor body evaluations, and associated anxieties are particularly prevalent among the student dance population. Grounded in self-determination theory (SDT), this study examined the relationships among perceptions of autonomy support, motivation regulations, and self-evaluations of body-related concerns in the context of vocational dance. Three hundred and ninety-two dancers completed questionnaires regarding their perceptions of autonomy support in their dance school, reasons for engaging in dance, self-esteem, social physique anxiety (SPA), and body dissatisfaction. Structural equation modeling analyses revealed that perceived autonomy support predicted intrinsic motivation (+) and amotivation (-). Extrinsic regulation positively predicted SPA. Amotivation mediated the associations between perceptions of autonomy support and dancers' self-esteem, SPA, and body dissatisfaction. The utility of SDT in understanding predictors of self-worth, physical evaluations, and associated concerns was supported. Moreover, this study provides preliminary evidence supporting the applicability of SDT in dance contexts.

Recent statistics suggest that close to 16,000 young people in the UK study for a high school certificate in dance (GCSE), and approximately 3,000 young dancers are currently engaged in full-time vocational dance training.[1] Drawing from the research that has been undertaken with such populations, the defining message appears to be that dancers' physical and psychological welfare is often undermined. Body image concerns, low self-esteem,[2] and eating disorders[3] are reported to be more prevalent among dancers than their non-dancing peers. It is often assumed that dance instructors, choreographers, and directors are implicated in these results.

The meaning of dance to the individual is held to be central to the quality of dancers' engagement in this performing art.[4] Yet, despite numerous anecdotal accounts, to date limited research has considered the social-environmental and motivation-related factors predictive of variability in the physical and psychological health of dancers. Self-determination theory[5,6] provides a theoretical lens through which the contextual and motivational dimensions that contribute to healthful participation in activities, such as dance, may be considered.

Eleanor Quested, Ph.D., and Joan L. Duda, Ph.D., are in the School of Sport and Exercise Sciences, University of Birmingham, Edgbaston, United Kingdom.

Correspondence: Eleanor Quested, Ph.D., School of Sport and Exercise Sciences, University of Birmingham, Edgbaston B15 2TT, United Kingdom; e.j.quested@bham.ac.uk.

Self-Determination Theory

Self-Determination Theory (SDT)[5,6] is a motivational framework that examines the determinants of optimal human functioning and development. Central to the theory is the degree to which behavior is considered self-regulated as opposed to externally controlled. Self-Determination Theory postulates that when a person's behavior is perceived as more autonomous or self-determined, he or she is likely to experience well-being and exhibit signs of effectual engagement. Conversely, when behaviors are regarded as controlled by internalized contingencies driven by something or someone else, mental health is expected to be compromised.[5]

Self-Determination Theory was developed in the field of educational psychology in the late 1970s. Since that time the theory has attracted substantial research attention in a diverse range of settings, including the workplace, healthcare, physical education (PE), exercise, and sport. A central tenet of SDT is that the theory's predictions should hold regardless of the cultural setting.[7] Thus, SDT is an attractive framework to promote understanding of motivational processes and optimal, as well as compromised functioning in dance.

Deci and Ryan[5,6] consider motivation regulations for behavioral

engagement to lie on a continuum with varying degrees of autonomy. The most autonomous regulation is intrinsic motivation, which underlies behaviors performed for authentic reasons, such as inherent enjoyment and interest. An intrinsically motivated dancer would dance because he or she loves to dance; the activity is undertaken purely for the intrinsic enjoyment of dancing. Extrinsically motivated behaviors are those that are instrumental in reaching a consequence separate from task participation. The level of autonomy associated with extrinsically regulated behaviors depends on the extent to which the related value has been internalized.[8] According to SDT, there are four types of extrinsic motivation: integrated, identified, introjected, and external. Deci and Ryan[5,6] conceptualize the most autonomous of the extrinsic regulations as integration. Integrated behavior regulation occurs when individuals have accepted the behavior as part of themselves and it is congruent with their goals, values, and needs. At the time of this study, no validated measure of motivation regulations that included integrated regulation and would be suitable for adaptation to a dance population was available. Therefore, integrated regulations are not considered in the present research.

When an individual has consciously identified with the value associated with a behavior, the regulation is relatively autonomous, as behavioral engagement has been accepted as personally endorsed.[8] This regulation is known as identification. Motivation to attend class driven by a dancer's recognition of the value of learning would be described as "identified." Introjected behavior regulations are relatively controlled by the individual; they are performed for the purpose of avoiding unpleasant psychological states, such as guilt or internal pressure. When a dancer feels that she "should" attend class to avoid feelings of guilt, her behavior regulation is "introjected."

The least autonomous of the extrinsic regulations is external motivation. Externally regulated behaviors would be performed in order to gain or avoid reinforcements, such as praise and punishment, or to conform to socially constructed contingencies.[5] If a dancer perceives that she must attend class because her parents tell her to, her dance participation could be described as externally regulated. Amotivated actions are passive and lack any intentional aim.[9] Amotivated dancers cannot identify any good reason to continue their training.

An increasing amount of evidence suggests that dance participation may not always be conducive to good health. However, a paucity of research has considered the precursors and health-related effects of motivation regulations among those engaged in vocational dance. Research suggests that coaches or teachers can contribute to the promotion or diminution of an athlete's or physical education student's self-determined motivation regulations for their sport engagement, and subsequently their well-being.[10,11] Similar work in exercise classes has supported this contention.[12] To date, no such evidence exists in dance contexts.

A recent study grounded in the SDT framework has implicated features of the dance teaching climate as predictive of dancers' psychological well- and ill-being.[13] In this study the perceptions of the motivational climate—the degree to which one considers the goal structure operating in one's environment to emphasize self-referenced (i.e., task-involving) or normative (i.e., ego-involving) conceptions of ability[14,15]—were the contextual features of interest. The findings suggested that the endorsement of task-involving dance climates (i.e., teachers emphasize individual effort, peer co-operation, and self-referenced judgments of ability) and ensuing support of dancers' perceived competence may promote more positive affect and less negative affect among dancers.

The present work centers on the concomitants of "autonomy support," which refers to the promotion of active engagement and a sense of volition in students, athletes, or dancers. Autonomy supportive coaches and teachers enable and encourage initiative and choice in learning,[9] share the other's perspective,[16] and strive to minimize the use of pressures and demands.[17] In contrast, controlling coaches and teachers are more likely to set a specific agenda for learning, with diminished opportunities for choice. In a dance environment lacking in autonomy support, pressures, rewards, and punishments are typically employed to coerce a behavioral outcome that is not in accordance with the dancers' preferred choices and desires. In such cases, the dancers' self-determination would be undermined and their personal enhancement thwarted.[9]

A central tenet of SDT is the proposition that socializing agents (e.g., dance teachers) who provide support for autonomy can create an environment that promotes internalization and more self-determined motivation regulations.[5] Previous research has provided support for this hypothesis in sport, PE, and exercise settings.[18] A key focus of the present study was to examine whether perceptions of autonomy support in vocational dance contexts are essential for dancers' inherent growth tendency toward internalization. Critically, we also set out to examine whether intrinsic, identified, introjected, external, and amotivated behavior regulations act as mediators between this environmental factor and indicators associated with dancers' psychological well-being. This theoretical proposition has received little consideration in the physical domain, but has been explored in other settings. For example, Niemiec and colleagues[19] found that adolescent students' perceptions of autonomy and relatedness support (also known as psychological need support) provided by their parents facilitated autonomous behavior regulations (in relation to pursuit of a college education). In turn, behavior regulations mediated the positive association between perceptions of need supportive parenting and indices of the students' psychological health. However, the mediating role of a relative autonomy index was examined in this study, and therefore the range of motivation

regulations assumed in SDT was not considered. In the present study we tested whether intrinsic, extrinsic, and amotivated behavior regulations served as mediators of the relationship between autonomy support and dancers' self-esteem and body-related concerns.

Motivational Predictors of Self-Esteem and Physique-Related Concerns

A considerable number of studies undertaken with both sedentary and physically active populations suggest that motivation regulations predict variability in indicators of well-being.[20] In such research, self-esteem is frequently employed as a gauge of psychological health. Self-esteem has traditionally been defined as the degree of respect and approval one grants to oneself, representing an individual's degree of adjustment and emotional stability.[21] Internalized behavior regulations are hypothesized to predict self-esteem.[22] The SDT-based assumptions regarding the correspondence between higher self-esteem and more autonomous behavior regulations have recently been supported in a study involving PE students.[11]

Self-esteem sits at the apex of a hierarchy of self-perceptions, with the perceived physical self considered to be a critical sub-component of overall self-worth.[21] A range of health behaviors, including dietary restraint, have been associated with compromised self-esteem and related negative physical self-perceptions.[23] Body dissatisfaction is recognized to constitute a risk factor for disordered eating[24] and may signify a pre-occupation with weight and exercising behaviors.[23]

Social physique anxiety represents another key physique-related concern. Social physique anxiety refers to an affective consequence associated with others viewing and evaluating one's body.[25] Discontent regarding one's physique and related anxieties tend to be more common among participants in physical activities with a focus on leanness and aesthetic qualities, such as dance.[26] Unhealthy eating pathology is a risk associated with experiences of social physique anxiety.[27]

Previous investigations in the physical domain have examined motivational predictors of compromised welfare, including reported exhaustion, physical symptoms,[28] and unhealthy eating practices.[29] Recent research in exercise settings provides preliminary evidence of the relevance of the SDT framework to our understanding of physical self appraisal and apprehension regarding body evaluations. In a study of aerobic instructors, intrinsic motivation positively and introjection negatively predicted exercise leaders' physical self-worth.[30] Introjected regulation corresponded positively to social physique anxiety, drive for thinness, and body dissatisfaction experienced by the exercise leaders. Self-determined motivation for exercise has also been found to predict adaptive self-evaluations reported by those who exercise.[31] These studies did not consider the social-environmental precursors of the motivation regulations and subsequent body-related evaluations or physique anxieties.

In sum, the purpose of our study was to test a model specifying interrelationships between vocational dancers' perceptions of autonomy support, motivation regulations for dance, and the self-esteem, body dissatisfaction, and social physique anxiety of student dancers. We also examined the mediating role of motivation regulations between dancers' perceptions of autonomy support in their dance schools and the self-esteem and body-related evaluations and concerns reported by dancers. Specifically, we tested the following theoretical sequence: autonomy support to motivation regulations to body dissatisfaction, social physique anxiety, and self-esteem (referred to as Model A in the results). Based on SDT,[6] we hypothesized that more self-determined motivation regulations and self-esteem would be positively predicted by perceptions of autonomy support. More controlling regulations, social physique anxiety, and body dissatisfaction were expected to be negatively associated with the dancer's perceived autonomy support. Extrinsic motivation regulations and amotivation were hypothesized to relate positively to the dancer's reported social physique anxiety and body dissatisfaction, whereas the relationships between these variables and self-esteem were expected to be negative. Based on past work,[11,22] we hypothesized self-esteem to be positively predicted by intrinsic motivation for dance. Self-determined behaviors are expected to predict desirable cognitive and emotional responses.[5] In accordance with this theoretical supposition, social physique anxiety and body dissatisfaction were expected to be negatively related to intrinsic motivation. The motivation regulations were hypothesized to fully mediate the relationships between dancers' perceptions of autonomy support in their dance schools and the outcome variables of interest in this study.

Previous research (in exercise contexts) has considered theoretical models in which body perceptions and concerns precede motivation regulations.[32] This suggests that one's physique perception determines the nature of one's motivation regulation for the activity in question. Researchers have also proffered self-esteem as a basic psychological need.[33] According to SDT, the degree of basic psychological need satisfaction one experiences predicts the level of autonomy undergirding behavior regulations. Thus, if self-esteem were a psychological need, one would expect self-esteem to predict motivation regulations, rather than the vice-versa relationship hypothesized in our model. Drawing from such work, dancers' self-esteem, social physique anxiety, and body dissatisfaction could be considered antecedents rather than consequences of their behavior regulations.

A reluctance to consider alternative models that may offer equally acceptable or superior explanations of the data leaves many researchers guilty of "confirmation bias."[34] With these statistical and theoretical arguments in mind, we also tested two models that offered alternative representations of the data. In our

first alternative model we examined whether motivation regulations for dance were predicted by autonomy support and individual differences in dancers' reported social physique anxiety, body dissatisfaction, and self-esteem (i.e., autonomy support, body dissatisfaction, social physique anxiety, and self-esteem to motivation regulations: Model B). In our second alternative model, we tested the hypothesis that perceptions of autonomy support predict self-esteem, body dissatisfaction, and social physique anxiety, which in turn predict motivation regulations for dance (i.e., autonomy support to body dissatisfaction, social physique anxiety, and self-esteem to motivation regulations: Model C).

Methods

Participants and Procedures

Participants were 392 dance students (96 male, 293 female, 3 gender unspecified; Mean age = 18.67, SD = 2.26) enrolled in full-time training in dance conservatories in the UK. Dancers reported that they had been at their school for an average of 20.38 months (SD = 16.31), and spent 31.87 (SD = 10.17) hours dancing per week. Prior to data collection, the primary researcher met with school personnel to explain the purpose of the study and solicit permission to invite the students to participate. Specific times were arranged for the researcher to meet with groups of dancers in classrooms or studios. The study was explained to the dancers and the voluntary nature of participation was emphasized.

All dancers and parents of dancers under 16 years of age were provided with information sheets about the study and asked to produce completed consent forms prior to participation. A multi-section questionnaire was administered by the principle investigator in a classroom or dance studio setting at a pre-arranged time during the school day. Dancers were requested to complete the questionnaire independently and to respond honestly. They were advised that there were no right or wrong answers and that their answers would not be shown to their teachers and would be kept entirely confidential. The questionnaire took approximately 30 minutes to complete.

Measures

Autonomy Support

Seven items from the Health Care Climate Questionnaire,[35] as adapted by Reinboth and associates[36] for the sporting environment, were employed to measure perceptions of autonomy support in the dance school. Minor adjustments in wording were made to enhance the items' relevance to dancers (e.g., "My teachers listen to how I would like to do things"). The questionnaire was scored on a one to seven Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7). The factorial validity and reliability of this scale has been supported in previous studies.[35,36] To date, the HCCQ had not been employed in studies involving dancers.

Motivation Regulations

The Sport Motivation Scale[37] was used to measure the dancers' motivation regulations for dance involvement, as conceptualized within SDT. As with the previously mentioned questionnaire, item wording was slightly modified to ensure relevance for the dance population. Participants were presented with the stem "Why do you participate in dance?" and asked to respond to 28 statements reflecting potential motives for dance participation on a one (does not apply at all) to seven (applies exactly) scale. The SMS measures intrinsic motivation to know (e.g., "For the enjoyment I feel while learning techniques/skills that I have never tried before"), intrinsic motivation to experience stimulation (e.g., "For the excitement I feel when I am really involved in dance"), intrinsic motivation to accomplish (e.g., "For the enjoyment I feel while improving some of my weaknesses"), identification (e.g., "Because it is one of the best ways to maintain good relationships with my friends"), introjection (e.g., "Because I must participate in dance to feel good about myself"), external regulation (e.g., "Because it allows me to be well thought of by people I know") and amotivation (e.g., "I don't know anymore; I have the feeling that I am not capable of succeeding in dance"). Previous work in the physical domain has provided support for the factor structure and reliability of the SMS.[38] To our knowledge this was the first study to employ the SMS in the context of dance.

Self-esteem

The 10-item General Self subscale of the SDQ-II[39] was employed to measure self-esteem. Dancers were asked to indicate how true (or false) each item (e.g., "Overall, I have a lot to be proud of") was as a description of themselves on a 6-point Likert scale ranging from "false" (1) to "true" (6). Psychometric analyses have supported the reliability and construct validity of this scale when administered to PE students[11] as well as young athletes.[28]

Social Physique Anxiety (SPA)

The extent to which dancers feel apprehensive when others view their physique was measured using the Social Physique Anxiety Scale.[25] This 9-item measure asks participants to indicate how true the statements (e.g., "In the presence of others, I feel apprehensive about my physique or figure") are for them on a scale from "not at all" (1) to "extremely" (5). The psychometric properties of this measure have been supported in students of a similar age to those in the present study.[40]

Body Dissatisfaction

Dancers' degree of body dissatisfaction was assessed with the 9-item Body Dissatisfaction scale from the Eating Disorders Inventory.[24] Dancers were asked to indicate whether the statements (e.g., "I think that my thighs are just the right size") are true for them on a scale of always (1) to never (6). The validity of this scale has been supported,[24] and the scale has exhibited good internal reliability and re-test stability in studies

Table 1 Descriptive Statistics, Internal Reliability, and Correlations of Each Measure

Scale	Mean	S.D	α	1	2	3	4	5	6	7	8	9	10
Autonomy Support	4.43	1.17	.89										
Intrinsic Motivation to Know	5.31	1.00	.73	.35†									
Intrinsic Motivation to Accomplish	5.31	1.07	.87	.28†	.63†								
Intrinsic Motivation to Experience Stimulation	5.67	.97	.77	.31†	.62†	.52†							
Identification	3.36	1.19	.69	.10	.30†	.25†	.22†						
Introjection	3.99	1.25	.65	.02	.29†	.31†	.34†	.40†					
External Regulation	3.07	1.27	.71	-.01	.11*	.23†	.07	.45†	.53†				
Amotivation	2.69	1.46	.86	-.39†	-.27†	-.24†	-.30†	.02	.14†	.22†			
Self-esteem	4.57	.83	.90	.33†	.26†	.21†	.13†	.07	-.15†	-.04	-.56†		
Social Physique Anxiety	3.24	.96	.91	-.18†	-.07	-.02	.03	-.01	.14†	.15†	.23†	-.34†	
Body Dissatisfaction	10.43	7.38	.88	-.13*	-.03	-.03	.11*	-.00	.19†	.08	.21†	-.38†	.74†

*p < .05; †p < .01

involving athletic and non-athletic populations.[41]

Data Analysis

Structural Equation Modeling (SEM) analyses were performed using version 17 of the AMOS software.[42] A two-step analysis approach was adopted.[43] First, the factor structure of each questionnaire and the overall measurement model were tested using confirmatory factor analyses (CFA). Subsequently, several fit indices were examined to determine whether the data demonstrated an adequate fit to the structural models. It is generally considered that a non-significant χ^2 indicates that the model has an acceptable fit to the data. However, the χ^2 is known to be affected by sample size.[44] Therefore, as indicators of absolute fit, the Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA) were assessed. The model is considered to have been well specified if the SRMR is .08 or less and the RMSEA is close to .06.[44] The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) were examined as incremental fit indices. Both the TLI and CFI should be greater than .95 to indicate good fit[44]; however, a less stringent cut off of .90 for the CFI has been suggested.[45] In cases where model fit was poor, revisions based on theoretically and statistically grounded reasoning were made to attempt to improve fit.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics, correlation matrix, and alpha coefficients for all measures. Alpha coefficients for all scales except identification (0.69) and introjection (0.65) were above the cut-off point of 0.7.[46] Coefficients of 0.6 have been considered acceptable in the case of established scales with few items.[47] The mean scores indicated that the dancers generally perceived their dance teachers to be autonomy supportive, and they had a predominantly self-determined motivation profile. As a group, the dancers had

relatively high self-esteem (4.57 on a 6-point scale), moderate SPA (3.24 on a 5-point scale), and low body dissatisfaction (10.43 on a 27-point scale). In a correlation matrix, the motivation regulations are hypothesized to order in terms of conceptual similarity, demonstrating a "simplex pattern."[48] Each regulation is expected to correlate more strongly with the closest regulation in the continuum than with those that are theoretically more discrepant. As has been found in other recent work[49] employing the SMS, correlations between the motivation regulations did not fully conform to the hypothesized simplex pattern.[48]

Construct Validity

Confirmatory factor analyses for the measures of autonomy support, SPA, and body dissatisfaction provided support for the construct validity of these scales. Full details are available from the first author on request. With respect to the assessment of motivation regulations for dance participation, a seven-factor model (including all seven of the SMS subscales) was tested. This model demonstrated poor fit (χ^2 [329] = 960.57, $p < .01$; CFI = .84; RMSEA = .07; TLI = .81; SRMR = .08). Results revealed several cases of cross-loading between the items from the three scales measuring extrinsic motivation, namely identification, introjection, and external regulation. It is not uncommon for researchers to group the regulations in a manner consistent with the tenets of SDT.[50] According to SDT, these three regulations are all forms of extrinsically motivated behavior.[5] Therefore, we tested alternative models in which these three scales were represented as one latent variable, labelled as "extrinsic regulation." A model including a composite intrinsic motivation factor (with the means of each intrinsic motivation subscale as the three indicators) and a composite extrinsic motivation factor (made up of three parcel indicators of two items from the identified, introjected, and external subscales) demonstrated better fit to the data (χ^2 [32] = 135.16, $p < .01$; CFI = .93; RMSEA = .09; TLI = .90; SRMR = .07). Simplifying the scale structure meant that we could no longer consider the identified, introjected, and external regulations independently. However, importantly, we were able to proceed with our analysis with a valid and conceptually sound measure of intrinsic regulations, extrinsic regulations, and amotivation.

The data in the present sample were not normally distributed (Mardia's multivariate coefficient = 38.38). Therefore, maximum likelihood estimations employing the bootstrap approach were utilized. Parcelling is known to improve data distribution and reduce correlated errors.[51] This technique is frequently used to decrease the number of indicators when testing a hypothesized model via multivariate statistics.[52] Based on this rationale, the hypothesized structural model was created from the formation of pairs and triads of the indicator items for each latent variable. The fit of the measurement model was tested and considered satisfactory (χ^2 [231] = 557.03, $p < .01$; CFI = .94; RMSEA = .06; TLI = .93; SRMR = .05).

Structural Model

In congruence with previous work,[52] the residuals of the motivation regulation factors were allowed to correlate with their neighbouring regulation in the continuum. From a theoretical perspective, this approach was deemed appropriate because SDT would not consider these adjoining motivation types to be orthogonal.[6] From an empirical standpoint, dependent variables with hypothesized interrelationships should be represented in this way in SEM. We also allowed the body dissatisfaction and SPA error terms to correlate. We felt this made conceptual sense, as other variables not represented in the model that were likely to induce SPA would also be associated with dissatisfaction with one's body (e.g., body weight).

The fit of the hypothesized model was reasonable, according to contemporary fit criteria (χ^2 [238] = 610.08, $p < .01$; CFI = .93; RMSEA = .07; TLI = .92; SRMR = .08). The modification indices indicated the addition of a path between body dissatisfaction and self-esteem. This seemed theoretically sound, given the status of body perceptions within the hypothesized higher order structure of self-esteem.[21] The correlation of the error terms of two of the body dissatisfaction indicators was also recommended. These items were re-examined and, given the similarity in their focus, it was considered appropriate that the associated errors were linked. These modifications led to a model providing better fit to the data (χ^2 [236] = 483.58, $p < .01$; CFI = .95; RMSEA = .05; TLI = .95; SRMR = .06). In pursuit of a more parsimonious model, the regression weights were examined, and non-significant paths were removed, one by one. This process resulted in a less complicated model with good fit to the data (χ^2 [240] = 486.34, $p < .01$; CFI = .95; RMSEA = .05; TLI = .95; SRMR = .06). The standardized estimates in this model (Model A) are illustrated in Figure 1.

Testing Mediation

The procedural recommendations of Baron and Kenny,[53] advanced by Holmbeck,[54] were followed to test mediation. Specifically, we determined whether dancers' motivation regulations mediated the relationship between their perceptions of autonomy support in the dance context and dancers' reported body dissatisfaction, SPA, and self-esteem. First, we assessed the fit of a model in which there were direct paths between the independent variable (autonomy support) and the dependent variables (SPA, body dissatisfaction, and self-esteem). This model indicated very good fit to the data (χ^2 [98] = 186.78, $p < .01$; CFI = .98; RMSEA = .05; TLI = .97; SRMR = .04). Paths between perceptions of autonomy support and each dependent variable were significant, satisfying the first criterion in examining mediation.[53] Second, one must examine the fit of the model when the paths between the independent and dependent variables are constrained to zero (i.e., Model A, Fig. 1). Perceived autonomy support was not hypothesized to predict extrinsic regulation

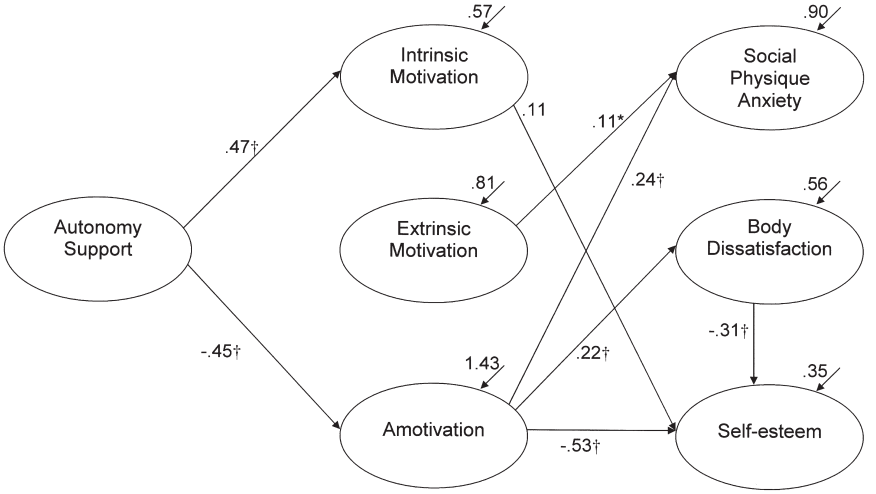

Figure 1 Revised model of motivational processes in dance (Model A); *p < .05; †p < .01.

in this model. However, a model was tested in which a path between perceptions of autonomy support and extrinsic motivation was added. As hypothesized, this relationship was weak and non-significant. For that reason, this regulation cannot be considered as a mediator. In Model A, there were no significant paths between intrinsic motivation and self-esteem, SPA, or body dissatisfaction. Therefore, it would not be appropriate to consider the mediating role of intrinsic motivation between perceived autonomy support and the dependent variables. The stipulation of significant paths between the independent variable and the mediators, and the mediators and the dependent variables,[53] were met in all other relationships in Model A.

In order to test the third condition of mediation, we examined the fit of a model in which the paths between perceptions of autonomy support and the dependent variables are unconstrained. This model had a good fit to the data (χ^2 [237] = 482.44, p < .01; CFI = .95; RMSEA = .05; TLI = .95; SRMR = .06). In step four, a mediation effect is considered to be evident if direct paths between the independent and dependent variables do not improve fit of the data to the model.[54] A χ^2 difference test indicated no significant difference between the models with these paths constrained or unconstrained (χ^2 difference = 3.9, p = .27). Indicative of full mediation, the coefficients of the direct paths between perceived autonomy support and the dependent variables reduced to insignificance with the inclusion of the mediators (SPA: from β = -.21 to -.12; Body Dissatisfaction: from β = -.16 to β = -.08; Self-esteem: from β = .30 to β = .05).

Testing Alternative Models

Two alternative models were tested to examine whether the relationships between the self-perception variables and motivation regulations operate in the reverse direction to the associations suggested in Model A. In Model B, body dissatisfaction, SPA, and self-esteem, as well as perceptions of autonomy support, were hypothesized to predict the three motivation regulations. This model demonstrated reasonable fit to the data (χ^2 [236] = 516.56, p < .01; CFI = .95; RMSEA = .06; TLI = .94; SRMR = .09). In order to make this model more parsimonious, non-significant paths were removed, one by one. This resulted in a model with good fit (χ^2 [242] = 529.31, p < .01; CFI = .95; RMSEA = .06; TLI = .94; SRMR = .09). The remaining significant paths in Model B were between autonomy support and intrinsic motivation (β = .41, p < 01) and amotivation (β = -.28, p < .01). The paths between SPA and extrinsic regulation (β = .17, p < .05), and between self-esteem and both amotivation (β = -.56, p < .01) and intrinsic motivation (β = .17, p < .01), were also significant. Body dissatisfaction significantly predicted self-esteem (β = -.44, p < .01). In Model C, perceptions of autonomy support were hypothesized to predict self-esteem, SPA, and body dissatisfaction, and paths were drawn between these variables and the three motivation regulations. This model illustrated an acceptable fit (χ^2 [235] = 525.51, p < .01; CFI = .94; RMSEA = .06; TLI = .94; SRMR = .06). Non-significant paths were removed one by one, leaving a model with satisfactory fit to the data (χ^2 [241] = 545.10, p < .01; CFI = .94; RMSEA = .06; TLI = .93; SRMR = .07). In Model C, there were significant paths between autonomy support and body dissatisfaction (β = -.16, p < .01), SPA (β = -.21, p < .01), and self-esteem (β = .32, p < .01). Paths relating self-esteem to amotivation (β = -.62, p < .01) and intrinsic motivation (β = .30, p < .01), and body dissatisfaction to self-esteem (β = -.38, p < .01) were also significant. SPA significantly predicted extrinsic regulation (β = .18, p < .01).

The Akaike Information Criterion (AIC) fit index is useful to evaluate competing, non-hierarchical models that have been estimated with the same dataset.[43] The AIC fit index calculation considers the number of parameters in the models as well as the statistical fit indices. The model with the smallest AIC is the most adequately fitting model with the fewest parameters. Model A was preferred based on the observed AIC statistic (Model A AIC = 606.34; Model B AIC = 645.31; Model C AIC = 663.10). Therefore, we concluded that Model A (specifying an "autonomy support to motivation regulations to body dissatisfaction, social physique anxiety, self-esteem" sequence) provided the most parsimonious representation of the data.

Discussion

Grounded in SDT,[5,6] this study examined the inter-relationships between perceptions of autonomy support, motivation regulations for dance, and the self-esteem and body-related

concerns of dance students. The assumed mediating role of motivation regulations for dance between perceptions of autonomy support in the dance context and dancers' self-evaluation tendencies was also tested. The findings of this study are largely supportive of the utility of the SDT framework for examining antecedents of self-esteem and physique evaluations and concerns. The results also provide evidence of the applicability of SDT in dance settings.

Autonomy Support in the Dance Environment

In agreement with our hypotheses, intrinsic motivation regulations for dance were positively, and amotivation was negatively, predicted by perceptions of autonomy support in the dance environment. Previous research in sport[10] and PE[55]settings has indicated that this internalization process can be attributed to specific features inherent to an autonomy supportive atmosphere. In an educational context, it is considered advantageous for students to be provided with opportunities to make decisions and have input into the tasks undertaken. In such settings, students will be more likely to take ownership of their learning process and associated outcomes.[56] The present study suggests that features of autonomy supportive environments are motivationally advantageous in dance settings.

Ballet teaching environments have traditionally been perceived as authoritarian settings in which the power and knowledge rests with the instructor.[4] Such environments provide minimal opportunity for student input and choice. Some teachers may consider this to be the most appropriate atmosphere in which to teach a formalized dance genre that demands precision in the execution of set techniques. In the present study, dancers typically perceived that their teachers provided moderate autonomy support (mean = 4.43). However, there was evidence of variability in the dancers' experiences of autonomy support in the dance schools (SD = 1.17, min = 1, max = 7). Our findings highlight the importance of providing dance teachers with the knowledge and skills that will enable them to create an autonomy supportive atmosphere that can coexist with teaching traditions. Encouraging student choices within the bounds of set limits[57] and providing competence feedback that is not controlling[58] are examples of autonomy supportive approaches to dance teaching.

The dancers in this study were asked to consider the prevailing environment within their school when assessing autonomy support. This prevented their judgment from reflecting any fluctuation in the degree of autonomy support they experienced over the course of a school day. For example, dancers may perceive different learning environments in contemporary and ballet classes. While ballet has a set vocabulary of movement, contemporary dance forms highlight versatility and novelty. The students' own ideas and interpretations are central to the artistic process in contemporary dance. Moreover, the level of autonomy support present in different classes may vary as a function of class teacher and dance discipline. To better understand the interrelationships between daily involvement in particular teaching environments and variability in motivation regulations and dancers' well-being, future research could adopt a diary-style methodology.[10]

Motivation Regulations and Dancers' Self-Esteem and Body-related Concerns

Previous research involving students generally[59] and PE students in particular[11] supports the SDT-driven contention that self-esteem is positively predicted by autonomous behavior regulations. In the present study, the path between intrinsic motivation and the dancers' reported level of self-esteem was positive but non-significant ($p = .07$). In full-time vocational dance training settings the dancers' proficiency (in what may be their principal endeavor at this point in their lives) is constantly under scrutiny. Therefore, it is plausible that these young dancers may experience fluctuations in global self-esteem regardless of their intrinsic motivation for the activity. It has been argued that measures of *stability* of self-esteem provide more informative indications of psychological well-being than *level* of self-esteem.[60] Self-esteem that is high and stable is most likely when one's actions are self-determined and behaviors reflect one's core values.[22] Thus, future studies in dance contexts should consider assessing both level and stability of self-esteem to aid understanding of the motivational antecedents of dancers' judgments of self-worth.

As hypothesized, amotivated dance participation negatively predicted the dancers' level of self-esteem. This finding suggests that when dancers lack intentionality with regard to their participation, their feelings of self-worth are also compromised. Extrinsic regulations did not predict the dancers' reported self-esteem in this study. The strength and direction of the relationship between self-esteem and extrinsic regulations is considered to depend on the degree of self-determination perceived to underpin the behavior.[10] In the present work, problems with the measurement instrument assessing the dancers' motivation regulations resulted in the need to collapse the three extrinsic regulations (identification, introjection, and external regulation) into one latent variable representing overall extrinsic regulation. While this resulted in the provision of a valid indication of the dancers' degree of extrinsic motivation for dance, we were unable to differentiate between the different types of extrinsic regulation. Therefore, it is perhaps not surprising that a null relationship between extrinsic motivation regulations for dance and dancers' self-esteem emerged. It is noteworthy that other studies have also reported problems with the discriminant validity of the Sport Motivation Scale.[55] Questions regarding the psychometric properties, and in particular the factor structure of this scale, have recently been raised in the literature.[61,62] Alternative measures of behavior regulations for sport have

been proposed.[63,64] The problems we encountered with the extrinsic motivation subscales of the SMS highlight the value of testing the theoretical properties of measurement tools via sophisticated analytical methods (e.g., confirmatory factor analysis). These limitations also suggest that dance researchers should proceed with caution when adapting instruments originally designed for use with other populations. Questionnaires developed for use with athletes, for example, may not adequately translate for application in dance contexts.[65]

Contrary to previous studies[30,31] and counter to our hypotheses, the dancers' social physique anxiety and body dissatisfaction were not predicted by intrinsic motivation in the present study. It is notable that the dancers' reported levels of social physical anxiety (male: M = 2.78; female: M = 3.38; scale = 1 to 5) were higher than the levels observed for non-dancers (male: M = 2.57; female: M = 2.77)[66] and athletes (male: M = 2.25; female: M = 2.88)[67] in previous work. Therefore, in explicating these unexpected findings it may be that the overt focus on aesthetic qualities in dance settings encourages excessive concern with physique aesthetics among dancers. In such a setting, it is possible that some dancers would experience a degree of body dissatisfaction and social physique anxiety regardless of their love for and intrinsic interest in the activity.

A significant and positive path emerged between extrinsic motivation and dancers' reports of social physique anxiety. This suggests that dancers whose behavior is driven by internal as well as external pressures are more likely to be vulnerable to the perceived judgments of others. In the studies by Thogersen-Ntoumanis and Ntoumanis,[30,31] introjection was the only type of extrinsic regulation to predict social physique anxiety reported by exercisers and exercise leaders. Employing independent measures of the extrinsic regulations for dance engagement in future research will help to determine whether this is also the case among dancers.

Extrinsic motivation did not significantly predict body dissatisfaction in the present study. This was surprising given that one might expect dancers whose motivation regulations were extrinsic to be more susceptible to both body dissatisfaction and social physique anxiety. Two of the items measuring introjection ("Because it is absolutely necessary to participate in dance if one wants to be in shape") and external regulation ("Because people around me think it is important to be in shape") reflect internal and external pressures related to physique appearance. These pressures may be transposed into feelings of anxiety associated with others viewing their bodies. However, the items in question do not indicate whether dance participation is driven by the dancers' (or other peoples') degree of satisfaction with their physique. Thus, it makes sense that the pressures captured by these items were related to anxiety regarding others viewing one's physique and not dissatisfaction with one's body. Maladaptive concomitants of external regulations have been found to emerge only in longitudinal studies.[68] Independent measures of identified, introjected, and external regulations in longitudinal investigations may help to reveal the associations between these regulations and body dissatisfaction and social physique anxiety. This study was the first to use the Sport Motivation Scale in dance contexts. Further work is necessary to develop or identify a more effective assessment of motivation regulations for dance.

Previous research[19] has considered the assumed mediating role of motivation regulations between autonomy support and indices of well-being using one latent variable to represent behavior regulation. A key aim of this study was to consider the mediating role of the full range of motivation regulations hypothesized by SDT. We were able partially to meet this goal, in that we could capture intrinsic and extrinsic regulations, as well as amotivation, in our structural model. Results revealed only amotivation to mediate the relationship between perceptions of autonomy support in dance and dancers' self-esteem, social physique anxiety, and body dissatisfaction. Extrapolating from these findings, it appears that there are health risks that may befall the amotivated dancer. Recent research has suggested body dissatisfaction to predict more controlled regulations of eating behaviors and dysfunctional eating.[69] Deci and Ryan have suggested that disordered eating behaviors may be understood as attempts to compensate for diminished autonomy in an important life context, and this proposition has received empirical support.[70] Thus, amotivated dancers may be more susceptible to engagement in health compromising behaviors. Recent research has suggested that self-determination at the general level may act as a protective buffer against societal pressures regarding body image and subsequent body dissatisfaction.[69] Therefore, the promotion of autonomous behavior regulations for dance may be considered as critical for healthful dance involvement.

Results indicated support for alternative models in which self evaluations and concerns preceded motivation regulations. However, the AIC index suggested that our original hypothesized model (Model A: autonomy support to motivation regulations to body dissatisfaction, social physique anxiety, and self-esteem) offered the most parsimonious representation of the data. Future investigations employing longitudinal or experimental study designs will help garner further confidence with regard to the direction of the associations between the variables of interest in this study.

Taken in their totality, the present findings are most informative about the motivational regulations associated with negative self-evaluations and body-related concerns of dancers. Most specifically, the potential negative consequences of amotivated dance participation are reflected in these results. However, the study is less telling about the motivational processes associated with self-esteem, an indicator of healthful dance participation. Moreover, intrinsic mo-

tivation was not significantly related to any of the targeted self-evaluation tendencies. Future research could consider using objective indicators of physical and psychological health status. Such methodological approaches have received a paucity of attention in the SDT literature. For example, an examination of the socio-environmental and motivational predictors of objective markers of injury, immune function, or stress hormone responses may provide greater insight into the mechanisms that underpin healthy as well as health compromising engagement in physical and educational pursuits.

Autonomy support constitutes only one aspect of the dance teaching climate. Future studies might also consider aspects such as the task- and ego-involving[13-15] features of the dance environment promoted by the dance instructor and artistic director as well as the peer-created motivational climate[71] in dance classes. These dimensions of the atmosphere manifested in vocational schools may also have implications for dancers' health, optimal functioning, and quality of engagement. Research examining potential contextual differences in perceptions of autonomy supportive teaching is also warranted.

Conclusion

Grounded in SDT, this study explored the interrelationships between perceptions of autonomy support in the dance setting, motivation regulations, and the degree of social physique anxiety, body dissatisfaction, and self-esteem reported by dancers. Findings provide preliminary evidence of the utility of the SDT framework in identifying the antecedents of self-evaluative tendencies and physique concerns. Supporting the applicability of the SDT framework to the dance context, findings highlight the importance of promoting autonomy support as an integral feature of dance teaching. The results suggest that in autonomy supportive classes dancers will be more likely to participate for intrinsically motivated reasons. In contrast, dance teaching environments lacking in autonomy support are more likely to leave dancers with a sense of helplessness and a lack of self-determination with regard to their dance participation. In essence, such environments seem more likely to result in amotivated dancers, who may be at increased risk of physical and psychological health deficits.

This study highlights the potential benefits of theoretically driven dance psychology research. Frameworks such as SDT can be employed to help researchers draw on previously established knowledge and explore (in a structured and logical manner) dance-specific phenomena. As a result, it becomes possible to put theory into practice. The development of dance-specific measures will be an important step in this process. Theory-driven dance psychology research will serve to improve the health and quality of experience of those engaged in dance.[65]

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